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American Bridge
Division of
United States Steel

AmBridge

Modular Schools



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AmBridge Modular Schools



USS AmBridge Modular Steel Schools represent a practical and beautiful solution to the classroom shortage that has grown to alarming proportions during the past decade. These modular schools combine engineering and erecting methods that permit complete construction in weeks with proven materials that assure years of economical service.

Colorful **AmBridge Modular Steel Schools** have evolved from years of integrated research, engineering, fabricating and construction activities involving architectural and structural applications of steel. The resulting modular components and construction techniques achieve an architectural triumph of beauty, speed, durability and economy.

The utilization of flexible **AmBridge Modular Steel School** components permit the designer full expression of modern architectural features.

Every **AmBridge Modular Steel School** component has been tried and proven. Exterior panels are available in three

finishes and twenty-eight appealing colors, assuring immediate and permanent beauty. Interior baked enamel panels are available in a wide range of eighteen colors selected especially for school use, permitting great latitude with interior decor and aesthetic considerations. The structural components, including **AmBridge** standard and longspan open web steel joists, steel roof deck and tubular steel columns bring to these buildings economy and stability proven in literally thousands of construction applications.

Every **AmBridge Modular School** component is made of steel, providing peerless resistance to weather and vermin. Every component is fabricated to fit readily and precisely, making it possible to construct in weeks a beautiful building that will serve a lifetime.

Have your architect choose a beautiful **AmBridge Modular Steel School** as a fast, economical, and permanent answer to your community's classroom requirements.

American Bridge wishes to thank those members of the architectural and engineering professions who have assisted in the development of these modular components



AmBridge Modular Schools

Design and Construction Advantages

Freedom of Architectural Expression

The flexibility of the structural frame, the multiplicity of components and the almost limitless range of panel colors and finishes gives the designer great latitude for creativity. Modern architectural features can be freely expressed in an AmBridge Modular School.

Rapid Construction in Any Season

The size, mobility, light weight and precise fit of the structural components assures rapid construction the year round. This is truly "a school for next semester" — a school ready for occupancy weeks after ground breaking.

Permanent Color and Beauty

The attractive, eye-catching stainless, porcelanized or baked enamel steel panels will not dull or fade, and are easily cleaned, assuring your community a school of permanent beauty.

Quality Workmanship

Close inspection and rigid personal supervision throughout fabrication and construction by experienced American Bridge Engineers is a decidedly tangible extra that results in quality work to the smallest detail.





Maximum Space Utilization

The efficient columns and slim wall panels (2½" thick) require little space, permitting maximum utilization of floor area for educational purposes.

Flexible and Expandable

The flat ceiling and roof construction allows complete flexibility of room arrangements. The modular frame design permits expansion without marring the building's original appearance. The completely reusable steel panels can be moved quickly and easily to meet changing space requirements with minimum labor.

Great Durability and Corrosion Resistance

The sturdy construction that goes into an AmBridge Modular Steel School makes its useful life infinite for all practical purposes. The rugged steel components will remain extremely resistant to damage throughout the building's life. The steel panels will not shrink, warp or crack; the building is free from objectionable separation between floors, base boards and walls. As for surfaces, perfected stainless, porcelain and baked enamel surfaces have demonstrated the ability to retain original beauty and quality for decades.

Low Maintenance

The maintenance factor has been drastically minimized by the stainless, porcelain and baked enamel steel finishes. Maintaining the original high quality and architectural beauty

of these schools requires no extensive refinishing and expensive annual cleaning.

Weather-Tight and Vermin-Proof

AmBridge Modular Schools are precisely fabricated and solidly constructed to preclude damage from wind, water, or air infiltration. And being made from steel the school is invulnerable to vermin and insects.

Sound and Fire-Resistant

This school's sound-absorbing panels, combined with acoustical ceilings, results in a pleasant, quiet atmosphere. Its fire-resistant rating assures absolute safety for occupants.

Accommodation of Heating, Plumbing and Electrical Equipment

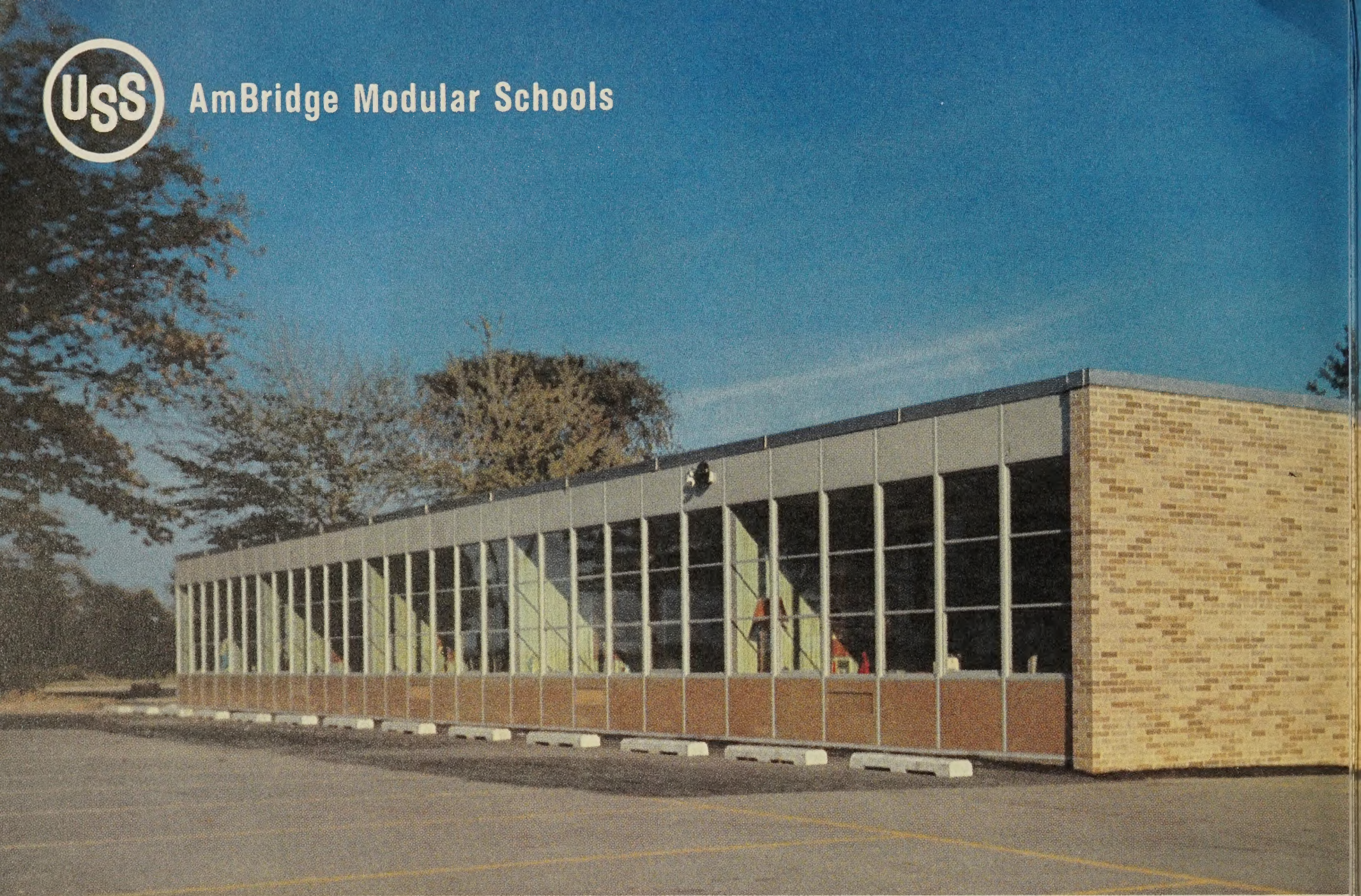
Heating, plumbing, electrical and fixed equipment can be installed easily and quickly in USS AmBridge Modular Schools. Connections and outlets can be made readily anywhere on both interior and exterior panels, and the AmBridge open web steel joists and steel panels provide a concealed space-saving accommodation for conduits and air ducts.

Lifelong Economy

An economy equation commonly used is first cost plus maintenance costs divided by years of service. Applying this formula to AmBridge Modular Schools' reasonable first cost, extremely low maintenance and great durability results in a remarkably high economy factor.



AmBridge Modular Schools





St. Margaret Mary's School
South Euclid, Ohio
J. Trevor Guy, Architect
Dross-Sanford, Contractor
From foundation to
completion — 17 weeks



Howard Seminary
West Bridgewater, Mass.
Harvey and Provost, Architects
American Bridge Division,
United States Steel, Contractor
From Foundation to
completion — 17 weeks



Interiors



Auditorium



Locker Room

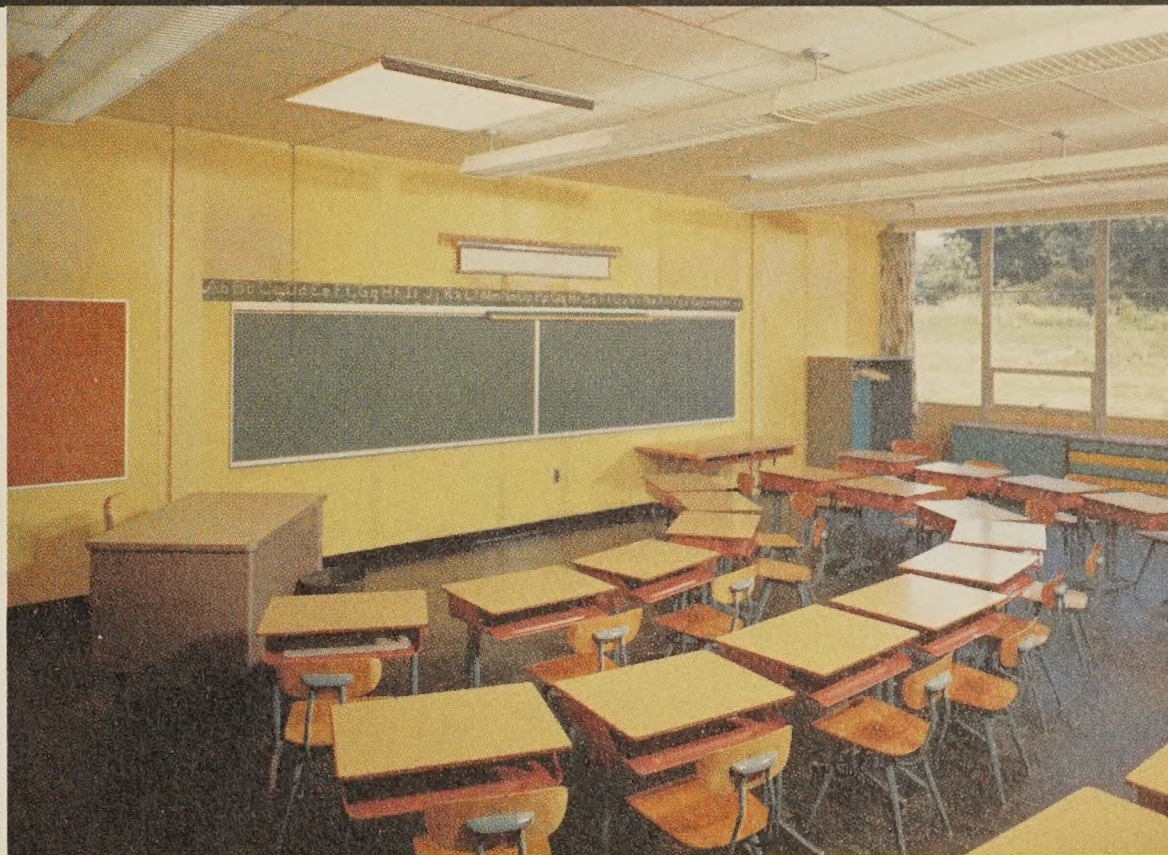


Lobby



Teacher's Room

Space utilization is infinite within the walls of an AmBridge Modular School. The pictures on these pages indicate that every need of students and faculty alike can be tastefully accommodated in these schools. Note the vast window areas serving a youngster's spirit as well as his eyes. The sparkling, sanitary stainless steel equipment provides a clean, easily maintained kitchen. Beautiful entrance areas, cafeterias, auditoriums, gymnasiums, and teachers offices — all are possible, practicable and beautiful with USS AmBridge Modular School components.



Classroom



Kitchen



USS AmBridge Modular Schools are designed to 4' modules with standard supporting bays of 8, 12 and 16 feet, with spans from 8' to 120' in 2' increments. Columns are 5" and 6" square tubing for spans up to 48'. Columns made from structural steel sections are used for spans of 50' and over. USS AmBridge open web steel joists and trusses are used for roof support. These supporting trusses, with square ends and bolted connections, frame between the columns. Intermediate steel joists having standard underslung ends are supported by the trusses. Roof framing for spans greater than 28' utilizes AmBridge longspan joists. In all cases the roof framing members are on 4' centers.

The standard design live loads are 20 and 30 pounds per square foot wind load and 30 and 40 pounds per square foot roof load. Structural designs for heavier or lighter live loads are available as required. Typical structural component utilization drawings are shown on pages 10 and 11. All structural components necessary for the design of your building are shown on American Bridge Standard Drawings, which are available to architects and designers upon request. All modular structural components for these school buildings are designed and fabricated in accordance with Steel Joist Institute and American Institute of Steel Construction specifications, latest adoption.

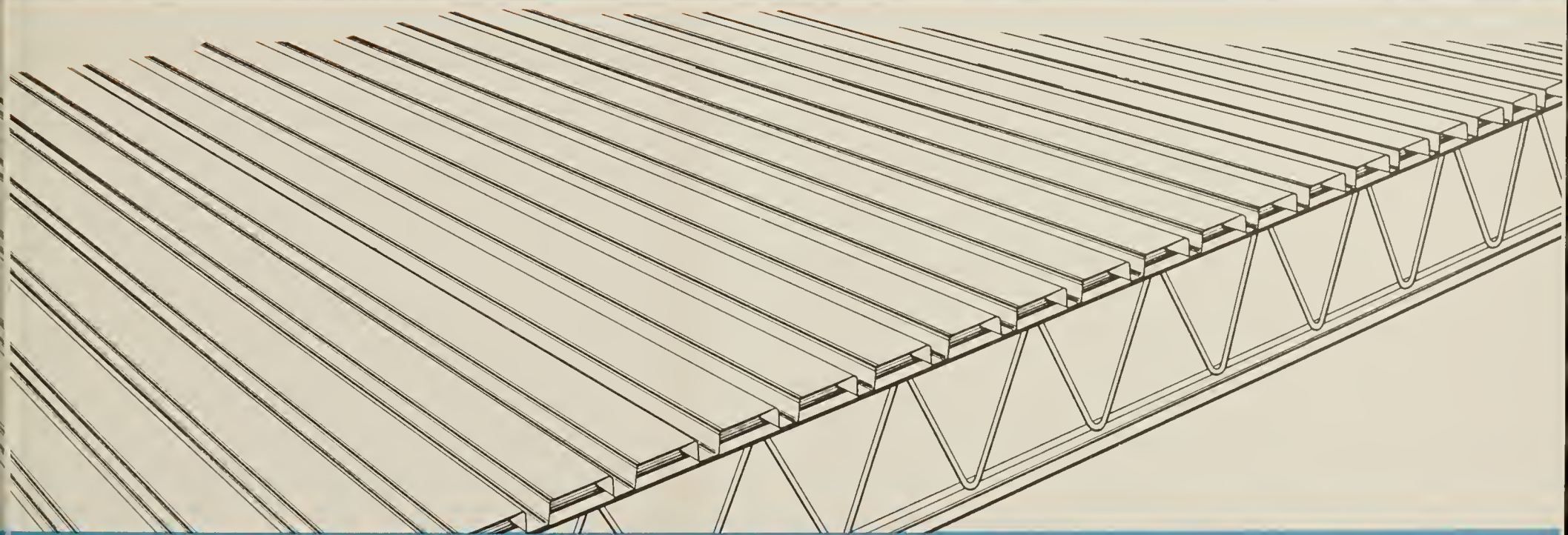
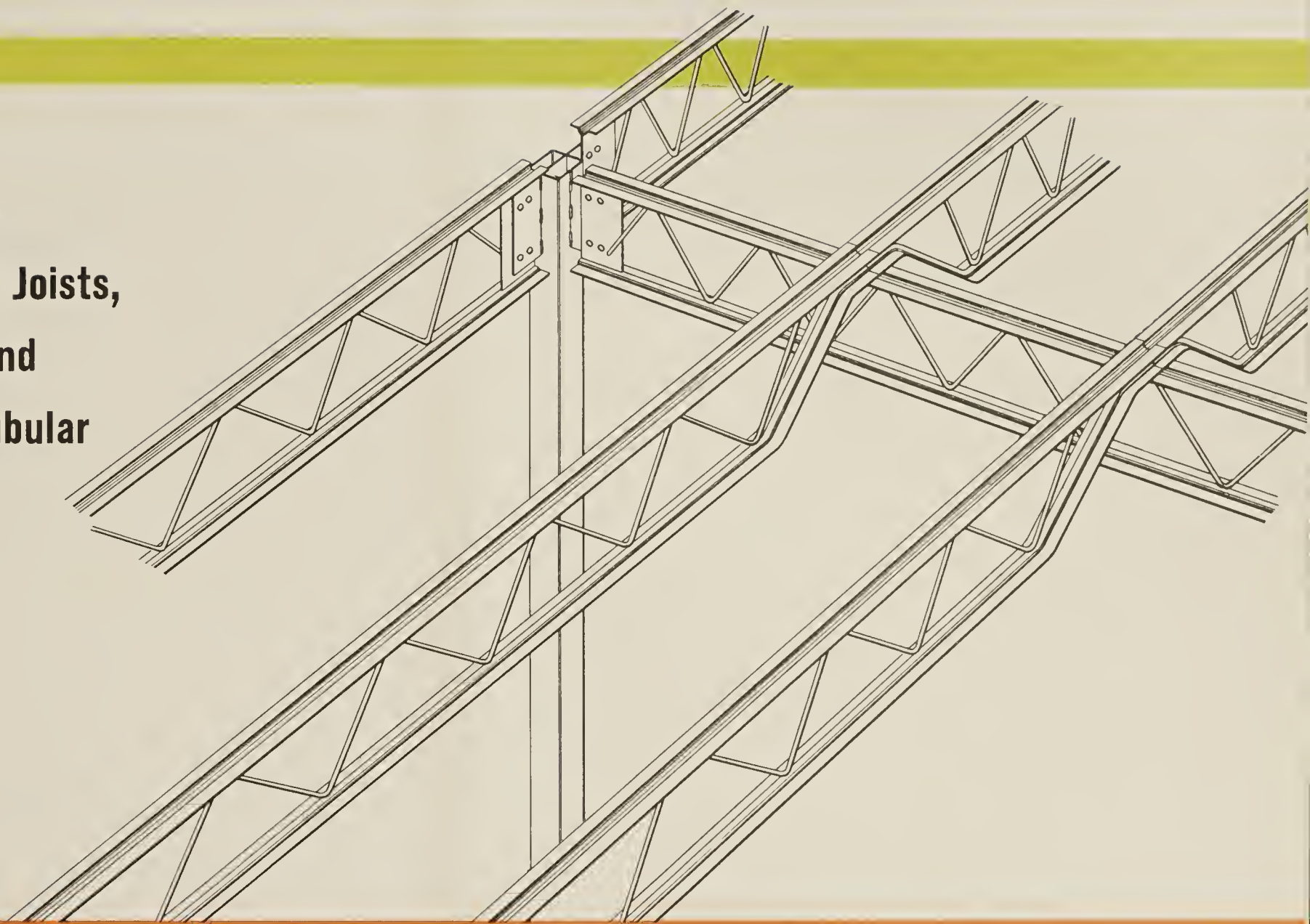
The roof deck for AmBridge Modular Schools is made of 22-gauge galvanized or bonderized and painted steel, with 1½" deep corrugations on 6" centers. The steel roof deck has a section modulus of 120, sufficient to support a 50-pound load on a 4' span, and will readily accept standard built-up roofing.

The basic structural designs were prepared by Mr. John M. Minnick, registered engineer, and former professor at Thayer School of Engineering, Dartmouth College.

Structural Frame

Steel Roof Deck

AmBridge
Open Web Joists,
Trusses and
Square Tubular
Columns





Utilization of Structural Framing Components

AmBridge Standard Joists J, JL, and JLL are available in 8', 12', 16', 20', 24' and 28' lengths, with AmBridge longspan joists available from 32' spans to 96'0". Heights from finished floor to top of steel may vary from 12' to 24'. Standard girders are available in 8', 10', 12' and 16' lengths.

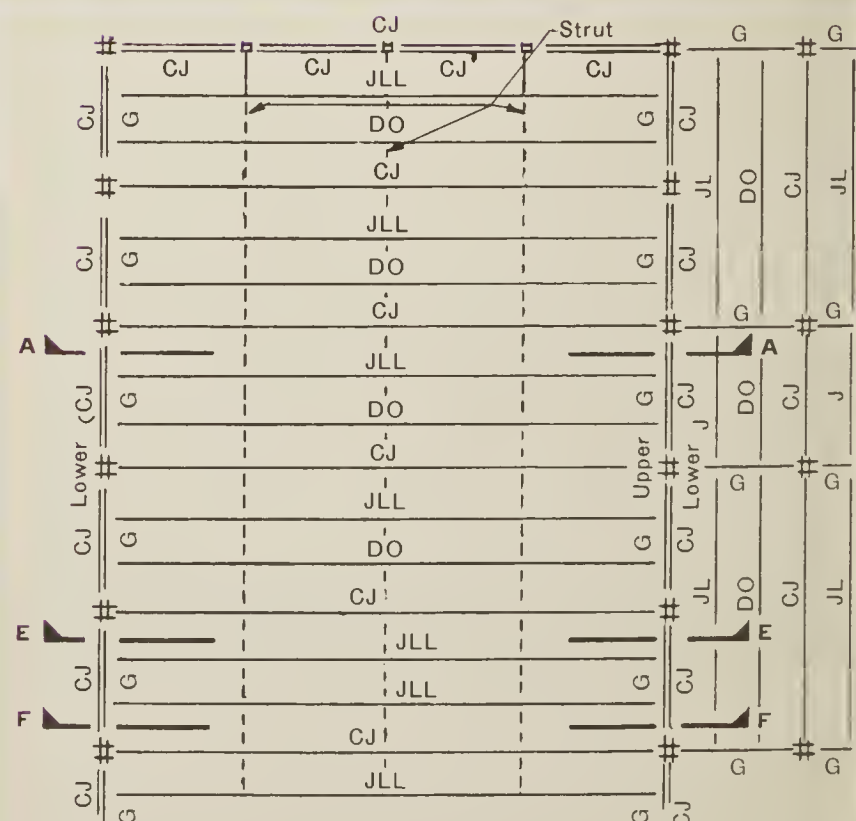
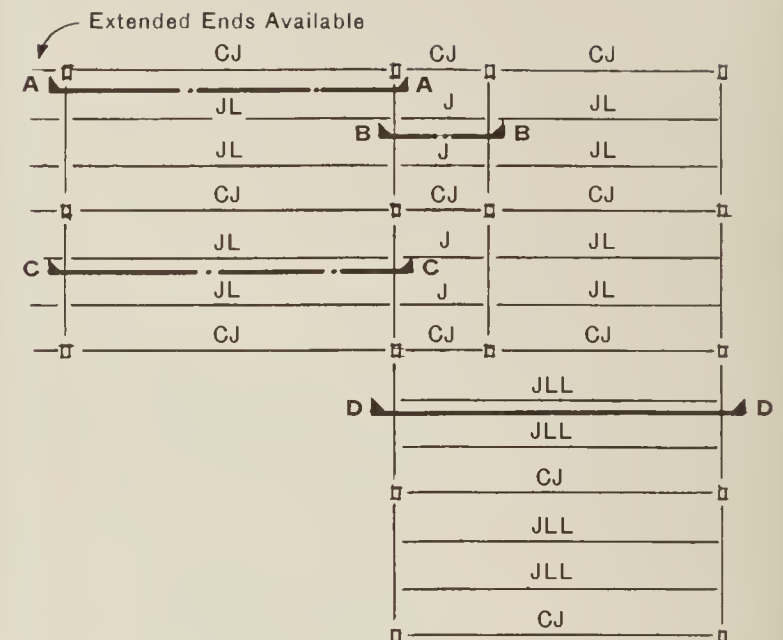
Design Data

Wind Load.....	20#
Roof Load.....	57#
Live Load.....	40#
Deck and Insul.....	4#
Roofing.....	5#
Ceiling.....	5#
Joists.....	3#
	57#

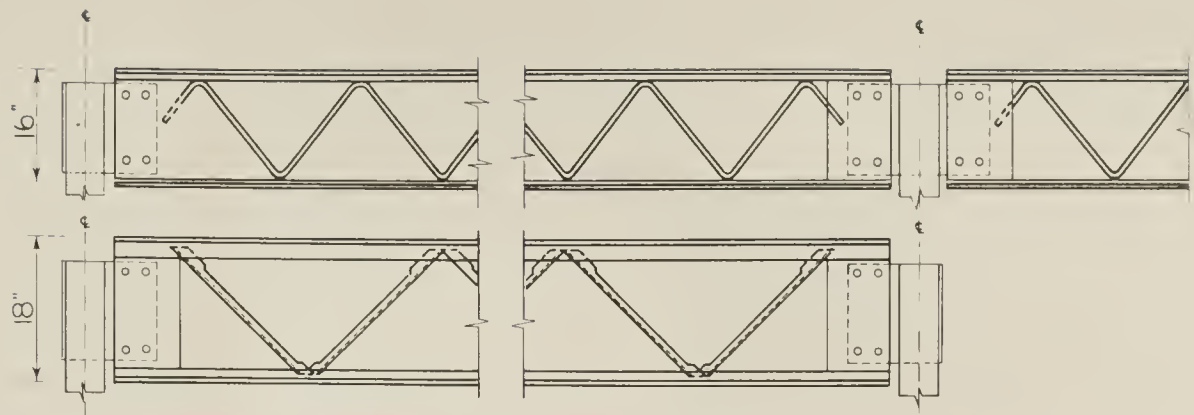
Member	Max. Tributary Spans @ 30# LL	Max. Tributary Spans @ 40# LL
G-2	2 @ 58 = 116	2 @ 48 = 96
G-3	2 @ 29 = 58	2 @ 24 = 48
G-4	2 @ 46 = 92	2 @ 38 = 76*
G-5	2 @ 30 = 60	2 @ 25 = 50*

*Use restricted by 5" column.

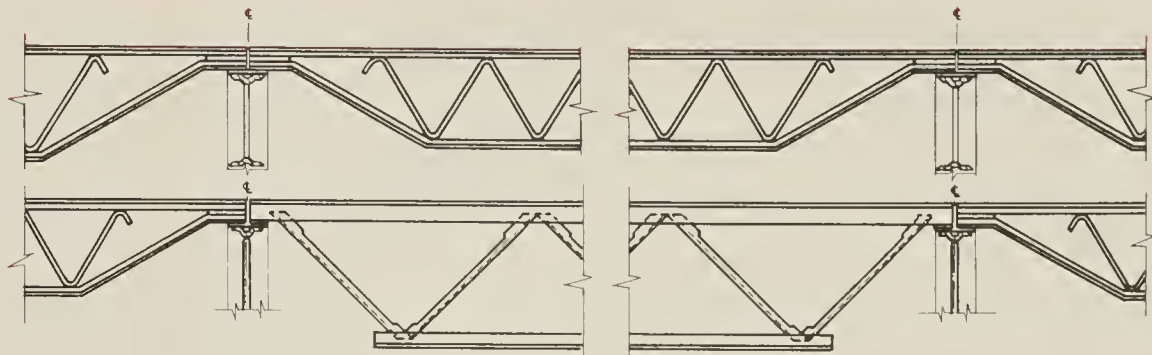
American Bridge Longspan Joists Available for Spans to 96'0".
(Extended Ends Available.)



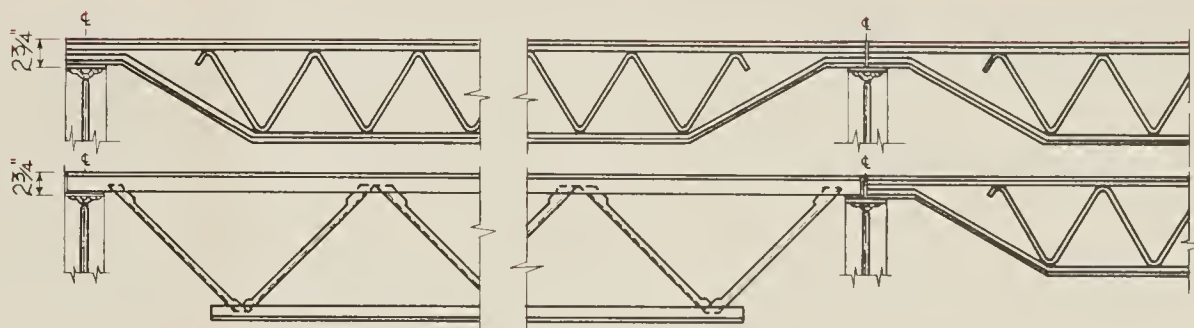
Section A-A



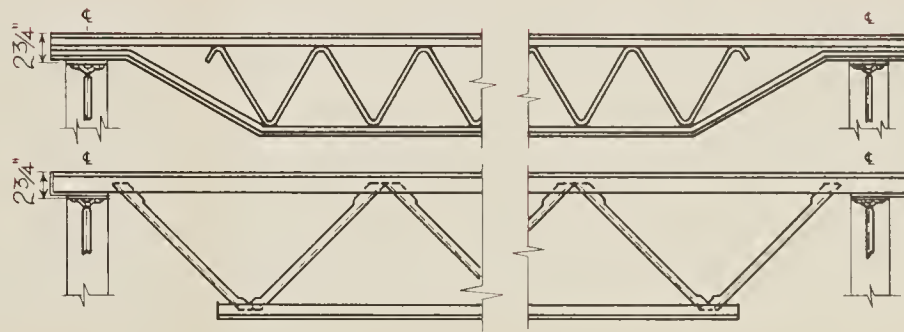
Section B-B



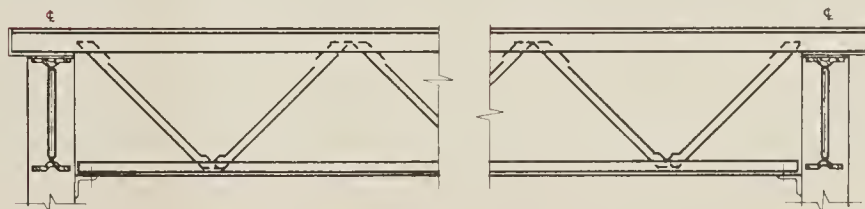
Section C-C



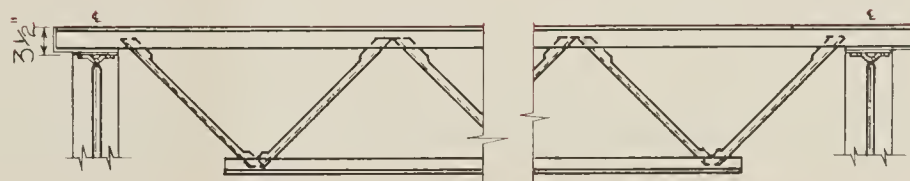
Section D-D



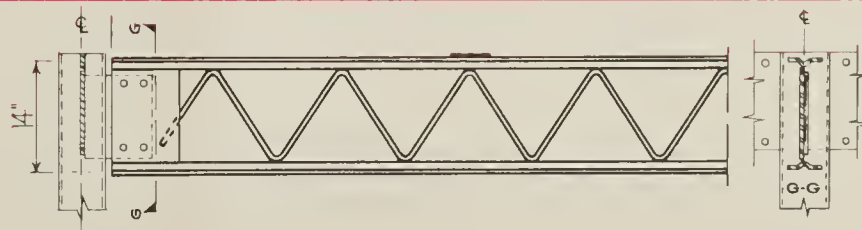
Section E-E



Section F-F



Girder "G"





Exterior Panels

These sturdy, attractive exterior wall panels are designed on a 4' module and run continuous outside the face of the columns. Panel frame height is approximately 11'2", or as required.

Exterior panels consist of 16-gauge stretcher-level porcelain sheets on the exterior, with 18-gauge baked enamel stretcher-level steel sheets on the interior. The structural frame of the panel consists of 12-gauge cold formed channel studs with a maximum spacing of 16". The face sheets are attached to the horizontal members at top and bottom by mechanical fasteners on 12" centers, and on 16" centers on vertical edges. Face sheets are attached to the intermediate vertical studs by means of an approved continuous adhesive strip. Face sheets are separated from the frame by a $\frac{3}{16}$ " x 1" continuous rubber compound tape on perimeter frame members. The panel is insulated with mineral wool, having a density of 2 pounds per cubic foot between sheets. These exterior panels shall meet high standards for physical strength, rate of heat transfer, fire and weather tightness, as required by the architect and certified by a testing laboratory. The colorful exterior panels are available in three finishes; time-proven stainless, permanently colorful porcelain and durable baked enamel.

Sash

The curtain wall panels for USS AmBridge Modular Schools have been designed to accommodate all architectural preferences and the various fenestration requirements of different school rooms. USS AmBridge Modular window walls are available with vertical and horizontal sliding sash, architecturally projected sash, and vented sash. Sash are available in baked enamel finishes on galvanized steel or aluminum.

Exterior Battens

The exterior batten is an extruded metal section with provisions for mechanical attachment without drilling from the interior of the building. The batten is given a baked enamel finish that matches the color of adjoining panels. They are fitted with neoprene weather-sealed gaskets applied in the shop. The interior batten is filled with snap-in closure and given a baked enamel finish in the color specified, and fitted with an approved weather-sealing gasket applied in the shop.

Intersection of
Exterior Plain Panel,
Sash Panel, and
Interior Panel
at Column



PE 220-E



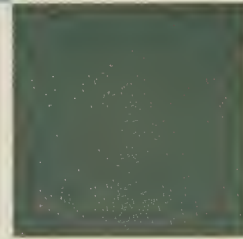
PE 219-E



PE 221-E



PE 399-D



PE 300-E



PE 397-D



PE 1327-A



PE 738-B



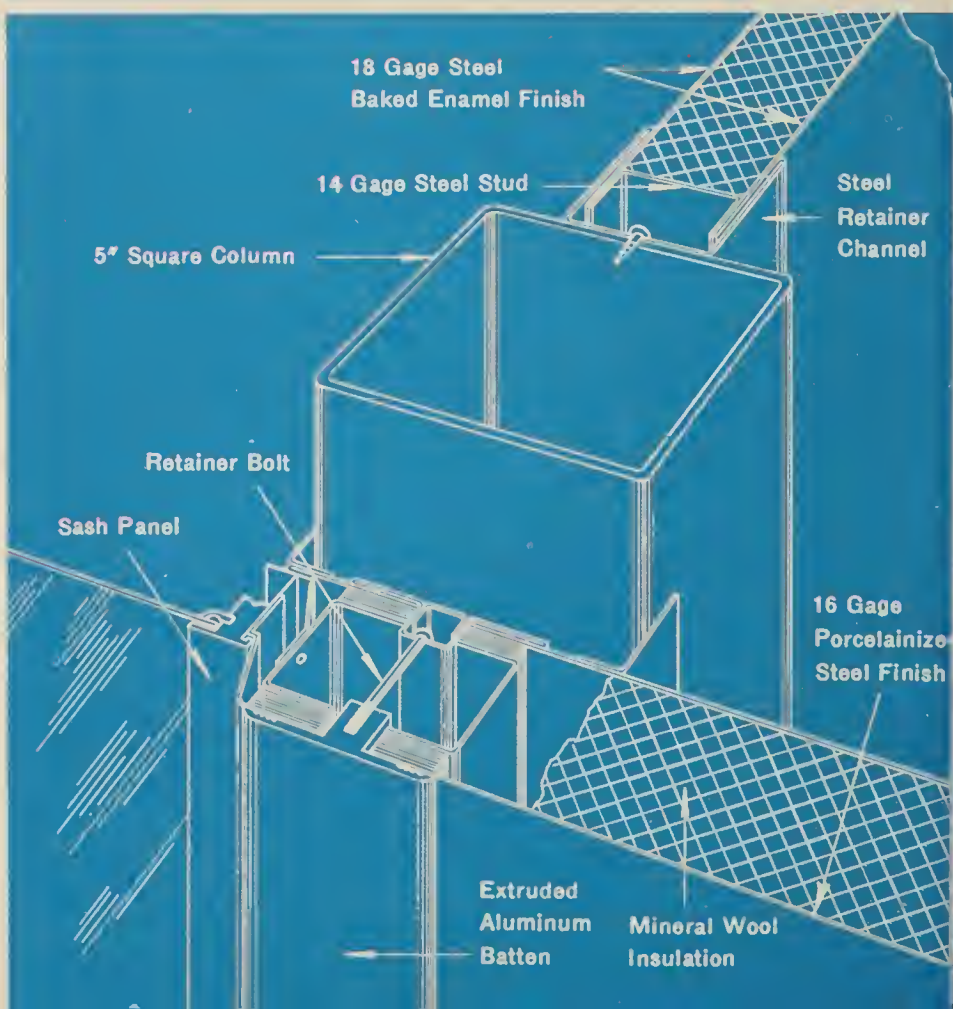
PE 1146-B



Stainless



PE 1147-B





Interior Panels and Door Frames

Interior panels for AmBridge Modular Schools are similar in construction to the exterior panels, and are available in 18 attractive baked enamel colors. The interior panels are approximately 9'9" high, or as required. Face sheets are made of 18-gauge stretcher-level steel with a baked enamel finish. The structural frame of the panel consists of 16-gauge channel material with maximum space of 24" center-to-center of the vertical studs. Enameled sheets are attached to the studs in the same manner as the exterior panels and the panel is packed with mineral wool of 2 pounds per cubic foot density to obtain a high sound absorption rating.

Panels are held against the lateral movement at the floor by means of a "C" section anchored to the concrete slab. The top of the panel fits inside a "C" section attached directly to the structural framing. This "C" section member shall have a baked enamel finish.

Where framed into columns, interior panels are held by a "C" section, running the full height of the panels. This and all other interior panel connections have a baked enamel finish.

The interior door frames are fabricated to a high-quality design standard from 14-gauge steel sheets. Door frames are attached directly to the structural frame and the concrete slab, and are given a baked enamel finish. These interior panels shall meet the standards for strength, sound transmission and fire, as required by the architect and certified by an approved testing laboratory.

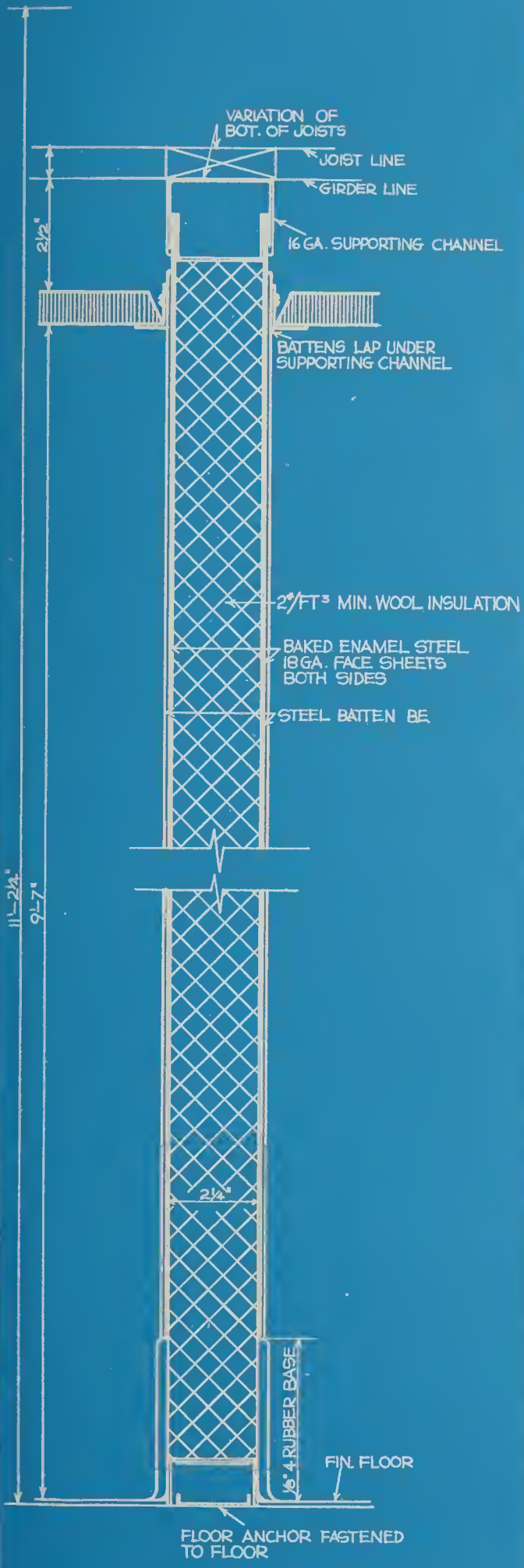
Interior Battens

The steel interior battens are the same type as those used for the interior side of the exterior wall, complete with a snap-in closure and a baked enamel finish.

Panel Accessories

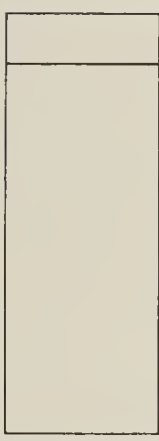
The interior trim of exterior walls consists of plates or sections of required gauges with a baked enamel finish. Panels are furnished complete with all clips, fasteners, screws or other mechanical devices required for proper erection. Screws or other mechanical attachments that are exposed to weather are stainless steel.

Interior Curtain Wall Sections



SECTION INTERIOR PANEL

Exterior and Interior Panels and Door Elevations



**Exterior
Solid Panels**

Available
Widths

47 1/4"
37 3/8"
17 3/8"
13 1/4"
7 1/4"
4 1/4"
5 7/8"

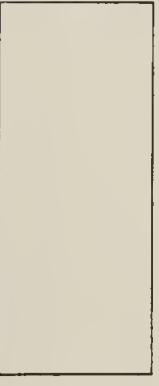
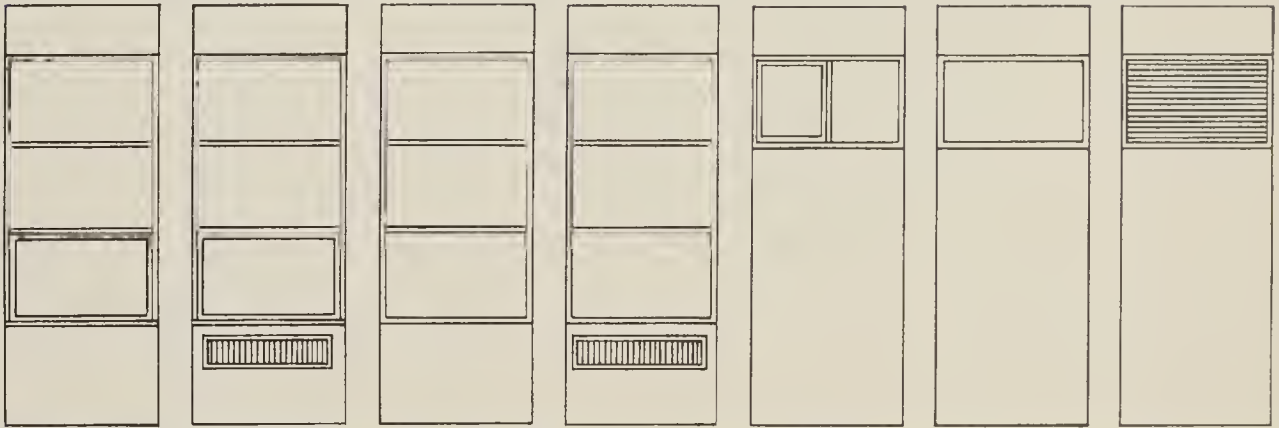


**Exterior
Doors**

Available Width,
Single Panel, 40"

Available Width,
Double Panel, 66"

Exterior Sash Panels



**Interior
Solid Panels**

Available
Widths

47 1/4"
44 5/8"
37 1/4"
32"
30"
23 1/4"
22"
20 5/8"
10 5/8"



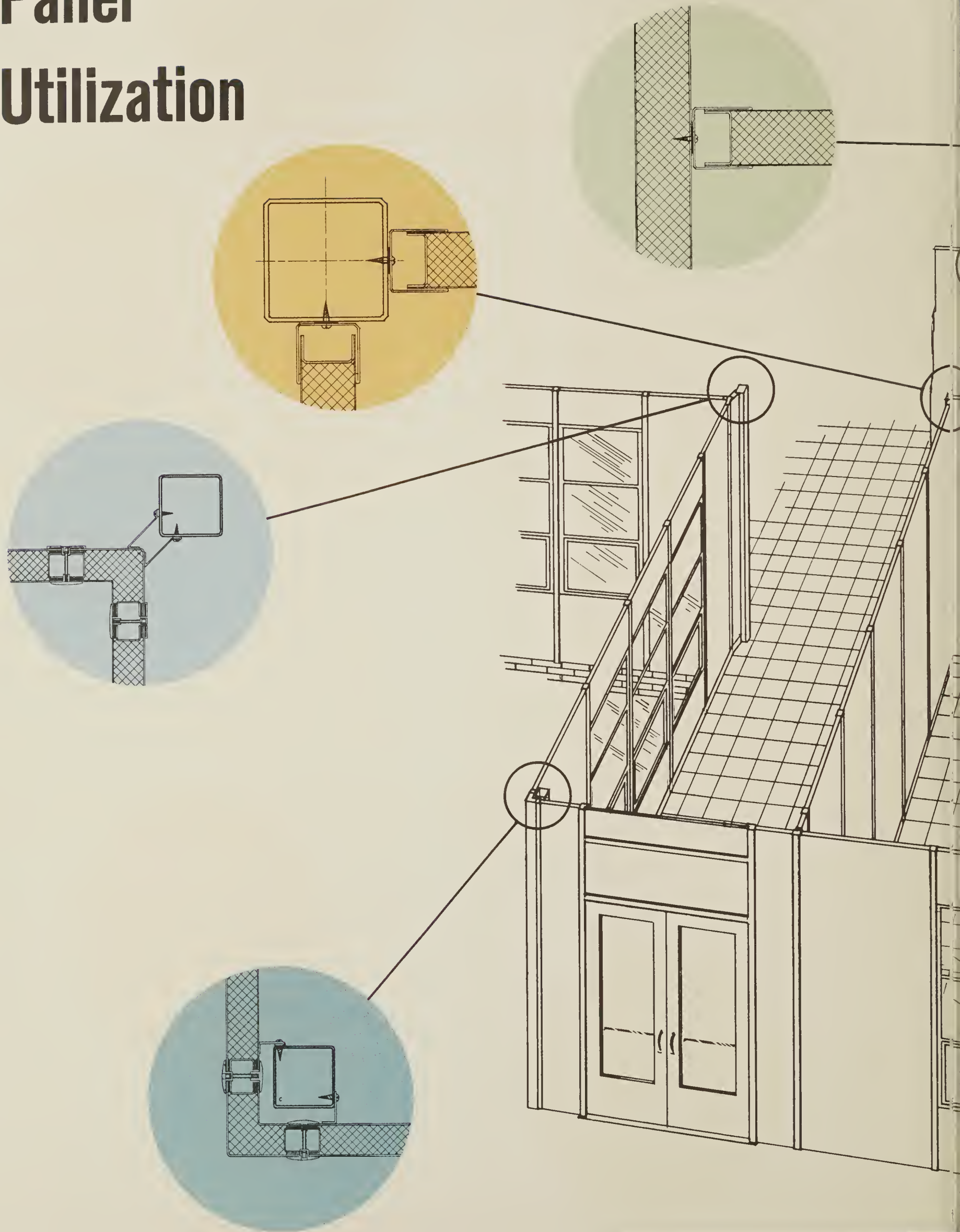
**Interior
Doors**

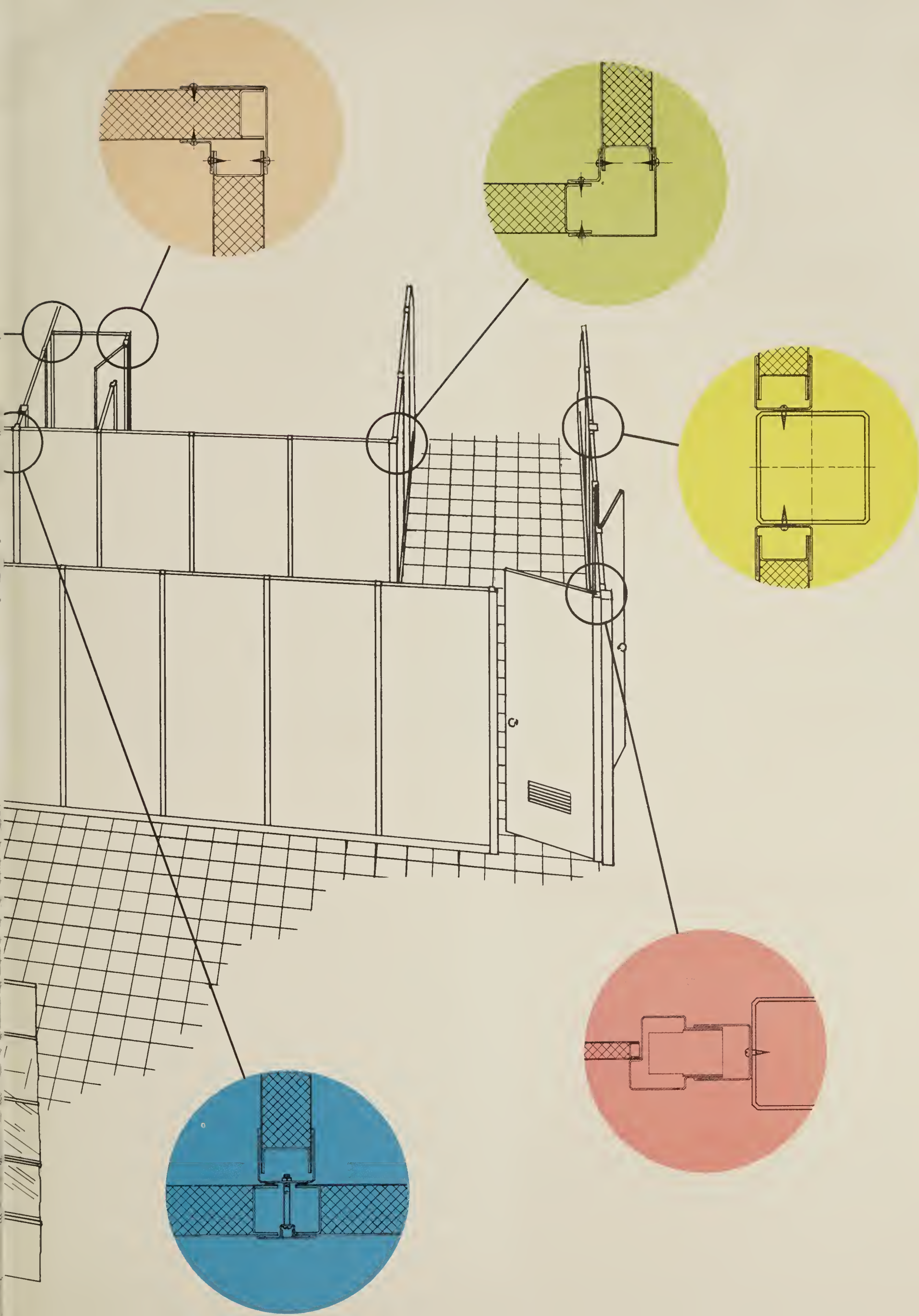
Available
Widths

30"
36"
40"



Panel Utilization







Test Performance

AmBridge Modular School Components

Steel Curtain Walls and Partitions

Thermal Insulation

USS AmBridge Modular Schools contain well insulated steel curtain walls, as certified in tests performed by the College of Engineering and Architecture of Pennsylvania State University. These efficient steel curtain walls provide a tested thermal “U” factor of .168 with a differential of 72°F., assuring comfortable temperatures at reasonable fuel and air conditioning costs.

Acoustical Values

USS AmBridge Modular interior panels with smooth, colorful surfaces and great sound absorption provide excellent sound control and reduce the transmission of undesirable sounds to adjoining rooms. The results of tests performed by Geiger and Hamme, Consultants in Acoustics, are listed below to illustrate attenuation in decibels at different cycles.

Frequency in CPS	Attenuation in Decibels
------------------	-------------------------

250	44
354	48
500	49
707	51
1,000	53

Finish

Porcelainized and baked enamel finishes are prepared and applied to panel surfaces in accordance with the specifications of the American Institute of Steel Construction, Porcelain

Enamel Institute, and the Steel Structures Painting Council. All finishes have been selected on the basis of their superior adhesion, marproofness, color retention, salt spray resistance, and stain and detergent resistance, as well as superior outdoor durability.

Continuous Joist Testing

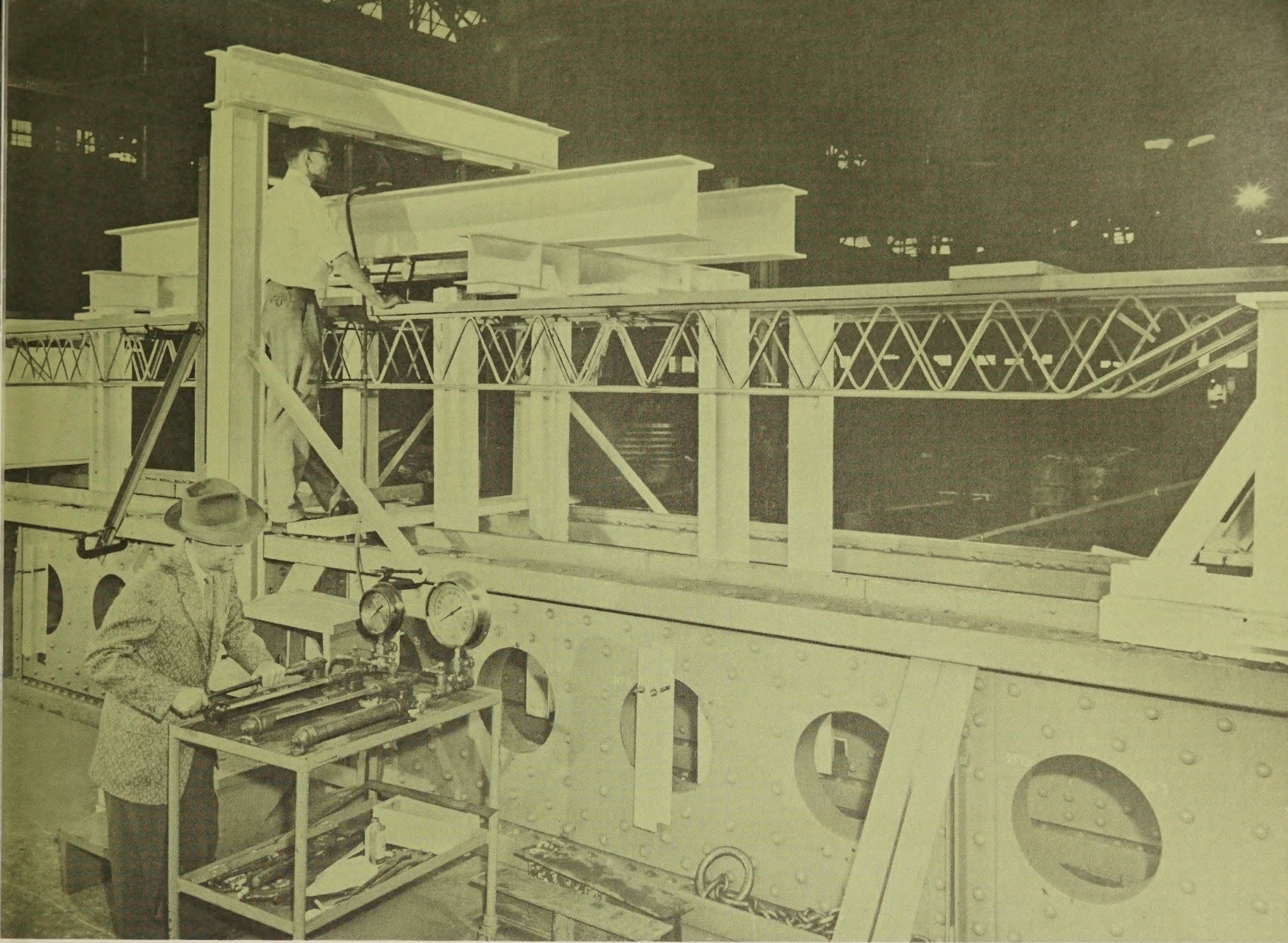
USS AmBridge standard open web joists are manufactured in accordance with Steel Joist Institute specifications, latest adoption, and under the continuous **quality verification program** of the Institute. In addition to this quality check, our own well trained engineers take joists out of production daily for extensive testing of materials and workmanship to insure high-quality performance in your building.

Technical Service

Every USS AmBridge Modular School is backed by American Bridge, the organization that has maintained consistent leadership in the construction industry for more than half a century. Every construction material and component utilized in an AmBridge Modular School has been thoroughly tested and proven by the various Divisions of the United States Steel Corporation, each leaders in their respective fields. For example, famous AmBridge Standard and Long-span Joists, and columns from the National Tube Division, make up the structural frame. All walls are made of USS steel panels. In many instances, mechanical piping and pipe for electrical conduit will be furnished by National Tube, and American Steel and Wire welded wire fabric will be used to reinforce concrete floors made from Universal Atlas cement.

American Bridge specialists are always available to furnish your architect all of the technical information he needs, and will apply their experience to be sure that the job is right to the last detail.

With an AmBridge Modular School you can be assured of complete, lasting satisfaction.



The Vital Role of the Architect

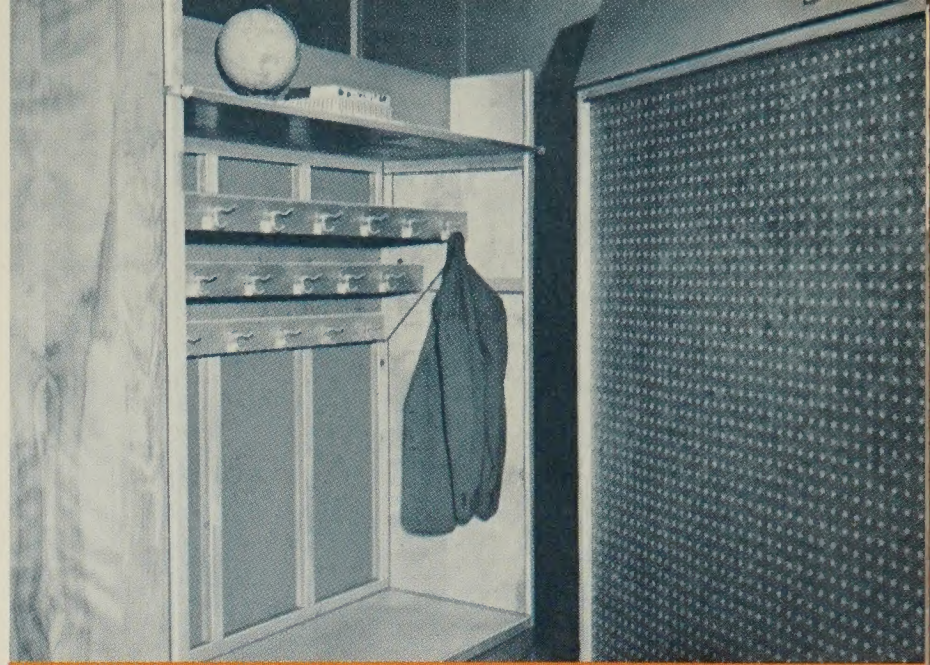
While the many components and materials that go into an AmBridge Modular School are of the highest proven quality, only an architect or engineer can properly coordinate their application to best meet his client's requirements. The architect or engineer possessing vast knowledge of local building conditions, requirements and an intimate understanding of the client's needs and financial ability, can skillfully create a beautiful, practical building that will be a permanent solution to your educational problems.

An attractive AmBridge Modular School Building, blending with existing architectural surroundings and economically accommodating all aesthetic and physical requirements, can be developed by the architect to suitably fulfill the owner's desires. To assure the owner's complete satisfaction with the functional arrangement, appearance, quality and performance of his AmBridge Modular School, American Bridge will always coordinate its research, engineering and construction experience with your architect or engineer.

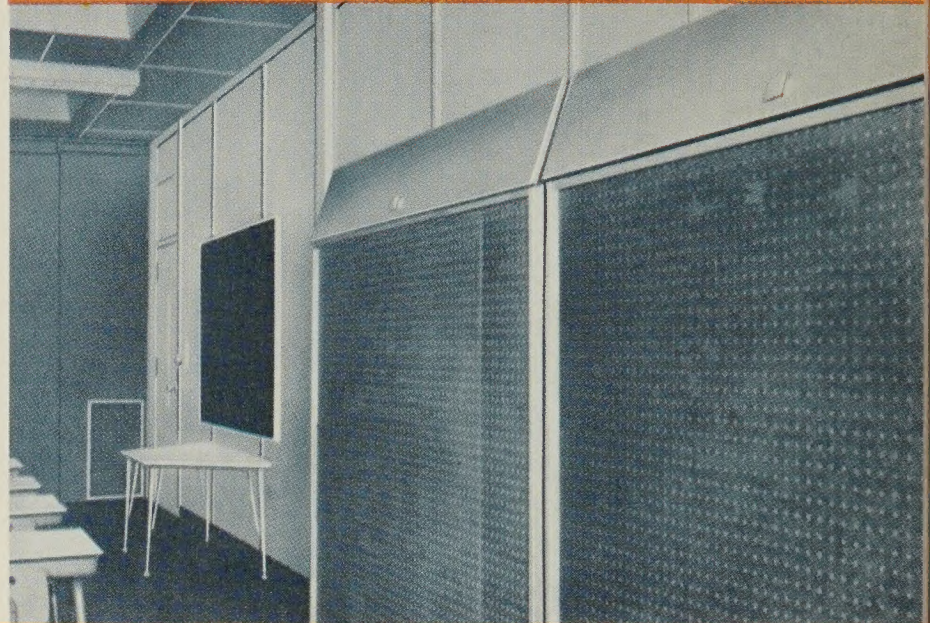




Quality Accessories



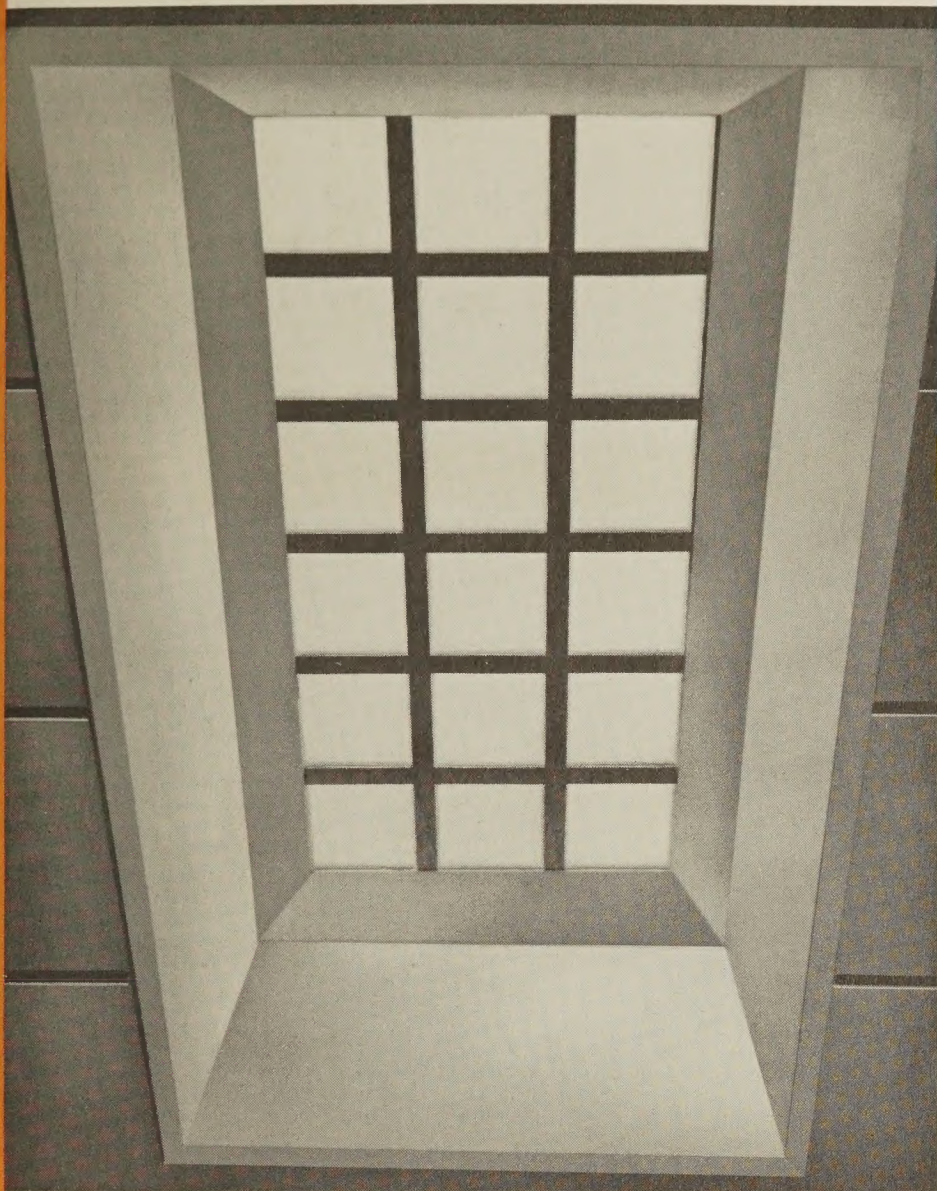
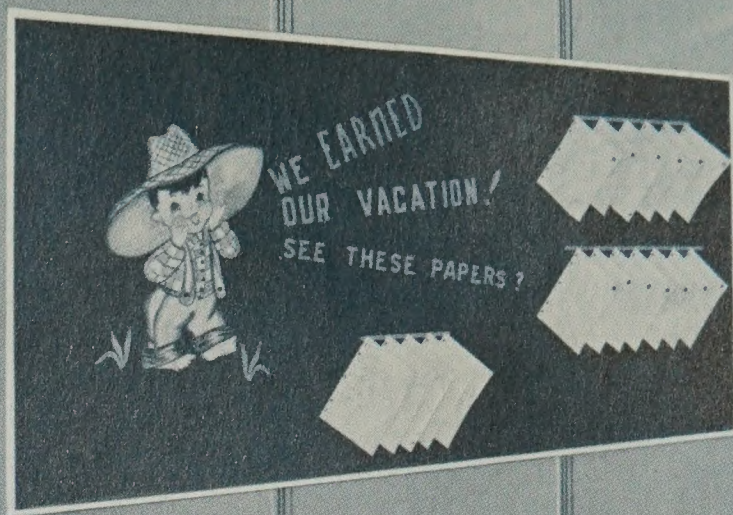
Movable Wardrobe



Furniture



Cork Tack Board

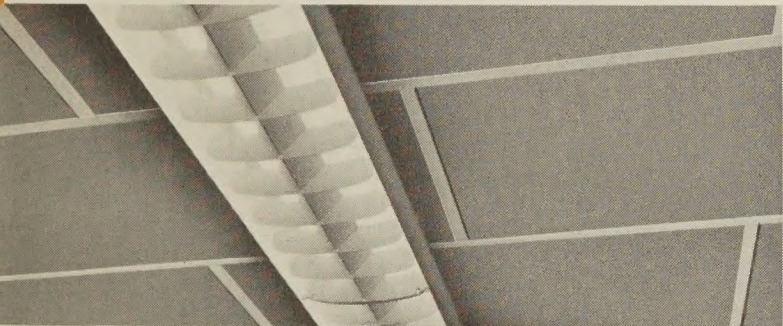


Skylight

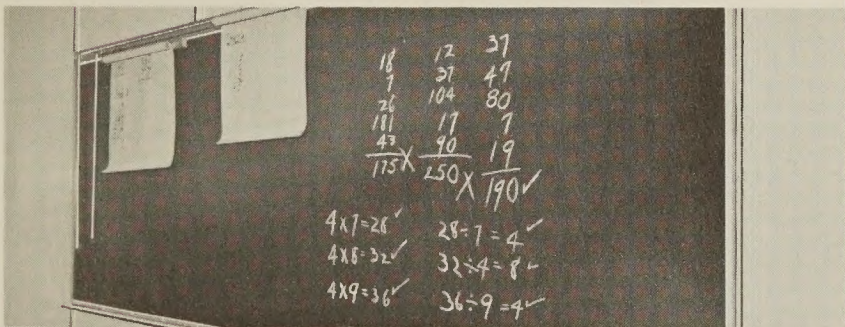
The accessories and furniture for USS AmBridge Modular Schools possess the ideal combination of style, stability and facility. Desks and chairs are as durable and functional as they are attractive. Strong weathertight skylights fit easily into the modular frame if additional natural light is desired. Sturdy fold-out tables and benches are easy to move and save valuable space for various activities in multi-purpose rooms. Movable wardrobes provide an economical accommodation for students' clothing and miscellaneous storage. Colorful, sanitary toilet partitions are designed to resist abuse and keep maintenance down.

Easy to use, easy to clean, porcelainized chalk boards and cork tack boards are standard classroom equipment. Top quality lighting fixtures provide sufficient, even light throughout the room.

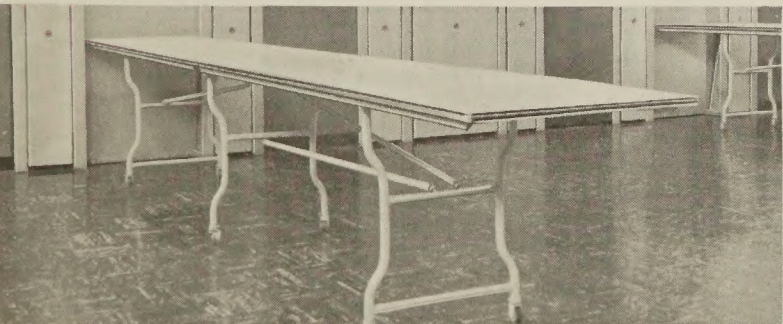
These and all other accessories were designed to make the USS AmBridge Modular School both pleasant and practical for student and faculty alike.



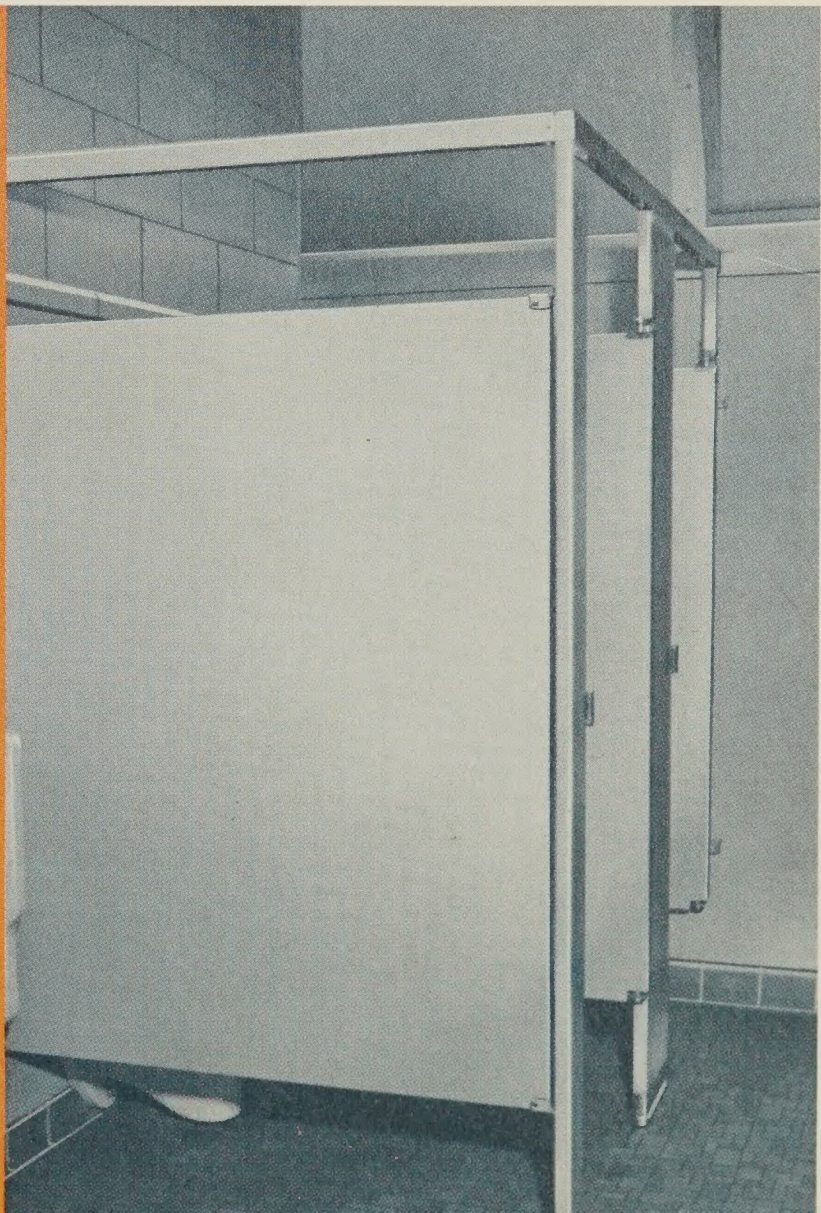
Lighting Fixture



Steel Chalk Board



Fold-out Table



Toilet Partitions



American Bridge
Division of
United States Steel

Contracting Offices

Ambridge
Atlanta
Baltimore
Birmingham
Boston
Chicago
Cincinnati
Cleveland
Dallas
Denver
Detroit
Elmira
Gary
Houston
Los Angeles
Memphis
Minneapolis
New York
Orange, Texas
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Portland, Ore.
Roanoke
St. Louis
San Francisco
Trenton

United States Steel Export Company, New York

General Offices: 525 William Penn Place, Pittsburgh 30, Pa.

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